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ABSTRACT

A study was conducted to determine the relative effectiveness of various techniques of accumulating and organizing images in multiple-screen, slide-tape presentations of geographical information. Identical stimulus materials were presented in five different ways from sequential presentation to accumulated presentation to programed accumulated presentation. A two-part test was developed to determine the comprehension of the image relationships and the comprehension of individual pictures and narration. A two-way analysis of variance was used on the resulting data. No significant differences were found in relative effectiveness among the five modes of presentation, in the mean scores between the males and females, or in the interaction effects between the sex and the modes of presentation. The highest mean scores on one part of the test were achieved using the programed image accumulation technique. This indicates that this mode of presentation might be significant over a longer instructional period. (JY)

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THE IMAGE-ACCUMULATION TECHNIQUE AS A VARIABLE IN MULTIPLE-IMAGE COMMUNICATION

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
Background	1
The Problem	2
Definitions	2
Hypotheses	3
Delimitations	4
REVIEW OF RELATED LITERATURE	5
METHODS AND MATERIALS	8
The Experimental Design	8
The Independent Variable	8
The Dependent Variable	11
Control Variables	11
The Stimulus Materials	12
Slides	12
The Taped Narration	12
The Testing Instrument	12
ANALYSIS OF DATA	15
The Statistical Technique	15
Tabulation of the Original Data	16
Analysis of Test Results	18
DISCUSSION.	21
Limitations	21
Recommendations	22
SUMMARY.	24
Bibliography	26
Appendix	28

LIST OF TABLES

Table		Page
1.	The Experimental Design	10
2.	Reliability of the Final Test, Summary Statistics . . .	16
3.	Immediate Test Results: Unadjusted Mean Scores	19
4.	Immediate Test Scores (Garfield): Two-Way Analysis of Variance	21
5.	Immediate Test Scores (Staunton): Two-Way Analysis of Variance	22

INTRODUCTION

The purpose of the experiment described in this paper was to study the effectiveness of some of the techniques of organizing and cumulating images in multiple-screen slide-tape presentations to convey geographical information.

Background

The advantages and deficiencies of multiple-image presentations have been discussed in several articles in the current literature. Cook (1960) expounded that the multiple-image technique applied the principle of contiguity, which means that if two items are to be associated, they should be presented to the audience close in space and time. Furthermore, Cook indicated that simultaneous images can permit a better structured message design. Hartman (1961a) recommended the technique of multi-channel communication, but he also warned of the danger of noise and interference associated with this kind of communication. Millard (1964) enumerated a list of classroom situations where multi-image techniques would be appropriate. Card (1966) commented: "If a high degree of transfer is sought, a simultaneous visual presentation appears to be most efficient." Travers and his associates (1966) also indicated that more learning would result with the use of multiple channels provided the information was presented at a slow rate. The receiver can hook up the various elements of the information, which greatly facilitates the formation of concepts. Perrin (1969) commented: "For visual comparisons, it seems axiomatic that simultaneous images

are more effective than sequentially presented images."

The Problem

These investigators think that multiple-screen presentations should have particular appeal for use in geography instruction. In many cases, students need to study the content of individual pictures, to make comparisons of them, and to identify the locations they depict. In this kind of cognitive learning, do students achieve better scores through multiple or single image presentations? Also, which kind of multiple-screen presentation is more effective in conveying this kind of information? In this study, the statement of the problem was formulated as: "Are multiple-image presentations which combine geographical pictures with related maps more effective than the sequentially presented single image technique in terms of achievement scores among the students in the tenth grades?"

Definitions

Only the more frequently used terms are defined here. Other terms are defined when they first appear in the text.

Image accumulation technique. The method of cumulating each succeeding image on the screen (or screens) with the purpose of generating multiple image communication. The different techniques of image-accumulation are described later in greater detail.

Single image. According to Allen and Cooney (1963:2), this is "a form of filmic presentation in which images are presented separately on the screen, each image disappearing as the succeeding image appears."

Multiple images. This is a form of filmic presentation in which the receivers see two or more images on the screen or screens. In this study, the multiple-image effect was not achieved by projecting the slides simultaneously, but by cumulating each succeeding image or some of the images on the screens.

Geographical pictures. These are pictures showing the relationship between human activity and its environment.

Hypotheses

The present experiment was designed to test the following hypotheses:

1. When related images are shown cumulatively on the screen and when the post-test is based on the relationships of the images, multiple-image presentations are significantly better than the traditional single image presentations. However, the issue is complicated by the fact that, by using different image-accumulation techniques, a multiple-image presentation can have different formats. It was also hypothesized that the format using a programmed image-accumulation technique would be better than the other formats in transmitting the messages in this experiment.

2. Students of either sex in the same grade react in the same manner to visual presentations. Thus male and female students should learn equally well.

3. Closely related to the above was the hypothesis that there is no interaction effect between a particular mode of visual presentation and the sex variable. In other words, the effectiveness of one

mode of presentation is the same regardless of the sex of the pupils.

Delimitations

A pilot study was conducted on December 4, 1970. The subjects were 25 ninth graders from the Indiana State University Laboratory School. In the pilot study, the technique used was that termed treatment IV in the main study.

In the final study, sources of data came from two separate schools in Indiana. A total of 143 tenth-graders in Garfield High School took part in the experiment on December 14, 1970. On the following day, the same experiment was replicated in Staunton High School with 61 tenth-graders.

In each of the two schools, the students were randomized into five groups, each of which received one of five different slide-tape presentations. The time for each presentation with its immediate post-test lasted 50 minutes. The order of the five treatments in each of the two schools was also randomized.

Content of the stimulus materials used in the study was the different types of human and natural landscapes in Hong Kong.

REVIEW OF RELATED LITERATURE

Research studies directly related to multiple image communication are comparatively few and sketchy. In the past ten years, the related literature has expanded enormously but, as Perrin (1969) pointed out: "The documentation is largely technical and descriptive." He estimated that only five pieces of research study in this area were available up until 1969.

Malandain (no date) of the Centre de Recherches et d'Etudes pour la Diffusion du Francais, St. Cloud, France, conducted a series of studies on picture perception. In one of his studies, he compared the relative effectiveness of showing filmstrips in single successive images and in grouped multiple images. Subjects were children in the primary classes. He found that "grouping the frames permits an increase in the number of recollections, but, above all, better organization of recollections."[1]

Roska (1958) also reported that "simultaneous presentation proves to be more effective than subsequent addition, especially with smaller children."

Allen and Cooney (1963) conducted a very careful experiment using a 2 x 3 x 2 factorial design to study the effects of simultaneous images on cognitive learning. Six filmographs were shown to students

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[1]Malandain, Claude. "Research on the Understanding of Film Strips," Ministere de L'Education Nationale, Ecole Normale Superieur de Saint-Cloud, France, Undated. (Mimeographed). Cited by W. H. Allen and S. M. Cooney, A Study of the Non-Linearity Variable in Filmic Presentation. Los Angeles: University of Southern California, 1963.

in the sixth and eighth grades, respectively. Three filmographs were produced linearly and three non-linearly. The content of the film was treated in three levels of abstraction. One pair of filmographs placed emphasis on factual matter, the second pair on concept, and the third pair on factual and conceptual content. Conclusions for the two grade levels were somewhat different. For the sixth graders: (1) Factual treatment is better presented linearly; (2) mixture of factual and conceptual treatment is better presented non-linearly; (3) neither mode of presentation is effective for conceptual treatment of the subject matter. For the eighth graders: (1) Males retain the subject matter best in the linear format; (2) females retain the subject matter best in the non-linear format.

The experiments of Malandain, Roshka, and Allen and Cooney all showed that multiple images were effective with primary children. "Mode of presentation has less effect on learning as the student grows older." (Allen and Cooney 1963:106). No satisfactory explanation has been put forward to explain these results which are rather contradictory to the current belief in the effectiveness of multiple images. Concerning these results, Perrin (1969) commented: "Further research is necessary to ascertain the exact reasons for these findings."

Lombard (1970) reported a study comparing the relative effectiveness of a single-screen tape-slide presentation with one using a three-screen tape-slide technique. The visual stimulus materials consisted of 35mm slides made from textbook materials which were shown linearly on one screen or non-linearly on three screens. Results showed that

the multiple-screen presentation was significantly effective for girls but not for boys.

The present study can be regarded as an extension of Lombard's study; but instead of comparing a single-screen with a three-screen presentation, five modes of visual presentations are compared. One mode used a single screen and four modes used multiple screens.

METHOD AND MATERIALS

For this experiment, stimulus materials were developed which could be presented in five different ways. A testing instrument based on the content of the message was also developed. The experimental design and the materials are described in the following sections.

The Experimental Design

The subjects in each school were randomized (page 21) into five groups. The visual materials, the sequence, the time, and the taped narration were the same for each group. However, the accumulation of the images on the screen or screens was different for each group, and was the independent variable in this experiment. Table I shows the experimental design.

The Independent Variable

There were five treatments for the independent variable, each of which was applied to one of the following groups:

Treatment I. This group saw only one image at a time. The images were presented separately and sequentially on one screen.

Treatment II. Images in the same sequence were projected cumulatively and regularly onto two screens. An image remained on one screen while the succeeding image was projected on the other, and it remained there until the third image appeared to take its place. In this treatment, the subjects saw two simultaneous images.

TABLE I

THE EXPERIMENTAL DESIGN

IMAGE ACCUMULATION TECHNIQUE AS A VARIABLE IN MULTIPLE IMAGE COMMUNICATION

TREATMENT I	TREATMENT II		TREATMENT III			TREATMENT IV		TREATMENT V		
Single Screen	Multiple Image Using Regular Sequence		Multiple Image Using Regular Sequence			Multiple Image Using Programmed Sequence		Multiple Image Using Programmed Sequence		
Accumulation Technique	Accumulation Technique		Accumulation Technique			Accumulation Technique		Accumulation Technique		
Screen	Screen	Screen	Screen	Screen	Screen	Screen	Screen	Screen	Screen	Screen
(1)	(1)		(1)			(1)		(1)		
(2)	.	(2)	.	(2)		(2)		.	(2)	
3	3	.	.	.	3	.	3	.	.	3
(4)	.	(4)	(4)	.	.	.	(4)	.	.	(4)
(5)	(5)	.	.	(5)	.	.	(5)	.	.	(5)
(6)	.	(6)	.	.	(6)	.	(6)	.	.	(6)
(7)	(7)	.	(7)	.	.	(7)	.	(7)	.	.
(8)	.	(8)	.	(8)	.	(8)	.	.	(8)	.
9	9	.	.	.	9	.	9	.	.	9
10	.	10	10	.	.	.	10	.	.	10
11	11	.	.	11	.	.	11	.	.	11
12	.	12	.	.	12	.	12	.	.	12
13	13	.	13	.	.	.	13	.	.	13
14	.	14	.	14	.	.	14	.	.	14
15	15	.	.	.	15	.	15	.	.	15
16	.	16	16	.	.	.	16	.	.	16
17	17	.	.	17	.	.	17	.	.	17
18	.	18	.	.	18	.	18	.	.	18
(19)	(19)	.	(19)	.	.	(19)	.	(19)	.	.
20	.	20	.	20	.	.	20	.	20	.
21	21	.	.	.	21	.	21	.	.	21
22	.	22	22	.	.	.	22	.	.	22
23	23	.	.	23	.	.	23	.	.	23
(24)	.	(24)	.	.	(24)	.	(24)	.	(24)	.
25	25	.	25	.	.	.	.	.	.	.
26	.	26	.	26	.	.	25	.	25	.
27	27	.	.	.	27	.	26	.	.	26
28	.	28	28	.	.	.	27	.	.	27
29	29	.	.	29	.	.	28	.	.	28
30	.	30	.	.	30	.	29	.	.	29
(31)	(31)	.	(31)	.	.	.	30	.	.	30
(32)	.	(32)	.	(32)	.	(31)	.	(31)	.	.
(33)	(33)	.	.	.	(33)	.	(32)	.	(32)	.
(34)	.	(34)	(34)	.	.	(33)	.	(34)	.	(33)
35	35	.	.	35	.	.	(34)	.	35	.
36	.	36	.	.	36	35	.	.	.	36
						.	36	.	.	.

. Accumulation of the image on the same screen - for example: slide (1) in treatment V has accumulated until slide (7) appears.

( ) Indicating Map-Slides.

Total number of slides = 36.

Treatment III. Images were projected cumulatively and regularly on three separate screens. An image remained on a screen until the succeeding images on the two other screens were completed. In this treatment, the subjects saw three simultaneous images.

It should be noted that the underlying principle of Treatments II and III was the same in the sense that the accumulation of the images was regular and that all images (except for the last one in the series) were accumulated.

Treatment IV. Images followed the same general sequence as in the first three treatments. Two screens were used. The image accumulation was "programmed" in the sense that some images accumulated for a longer time and others were shown in a sequential manner. Priority of accumulation was given to the "key images." For example, most maps would accumulate on one screen while illustrations were projected on the other screen and generally did not accumulate. Subjects saw two simultaneous images.

Treatment V. The same "programmed" image accumulation technique was employed; but three screens were used, and the subjects saw three simultaneous images at one time.

The term "key images" needs elaboration. In this study, "key images" were not defined as important images that will be reflected in the testing instrument. The study would be invalid if a few "key images" were shown on one screen and the complete test based on them. The word "key" is defined in terms of "relatability." It is assumed that some images can be more closely related to more images than others can. Such

images have a higher degree of "relatability." An image's priority for accumulation on a screen was based on its degree of "relatability" to the other images. By showing the more related images cumulatively and simultaneously, a hookup of the elements of the message is easier (Cook, 1960). This technique would also reduce the danger of jamming in the central internal perceptual system (Travers, 1966).

It should also be noted that "relatability" is related to the content of the presentation. An image with a high "relatability" to other images in one presentation may become one with a low "relatability" in another presentation.

The Dependent Variable

The dependent variable in this study was the achievement scores of the subjects in the post-test.

Control Variables

The following variables were hoped to be under control.

1. The total time span of the presentation and the time interval between two images in each treatment group were the same in both two schools concerned.

2. The same slides and taped narration were used in exactly the same sequence.

3. The same or nearly the same physical conditions, such as sound level, viewing and lighting conditions were maintained.

4. Each presentation including the test immediately following was conducted by the same person using the same procedure.

The Stimulus Materials

Slides

All together 36 slides were used as part of the stimulus materials. Thirteen were maps produced in the Media Laboratory of the I.S.U. School of Education. The remaining slides depicted the various geographical features in Hong Kong. In addition to the above, fourteen picture-slides were used as the testing instrument in Part I of the test. Since the pictures were photographed in Hong Kong, it is certain that none of the subjects would have seen these materials before.

The Taped Narration

A script of about 2,000 words was written to accompany the slides. The script was read by Mr. Paul Libassi of the Department of Speech and the tape was produced in the Broadcasting Studio of Indiana State University.

The Testing Instrument

The test was based on the content of the message alone. No background knowledge of Hong Kong was needed. It was divided into two parts, each of which consisted of fifteen items.

In Part I, visual materials were used as the testing stimuli. The aim of this part of the test was to measure the amount of comprehension of the relationship of images. In order to score high, the subjects needed to have related one image with another occasionally during the presentation; for example, relating a landscape to its location on the map.

In Part II, printed materials were used as the testing stimuli. The aim of this part was to measure the comprehension of the facts and concepts transmitted by the individual pictures and the taped narration.

The test covered most of the content of the message, in particular the information transmitted through the visual channel. A two-way grid described by Stodola (1967:15) was used in setting the test items. The content was validated by Professor W. Brooks of the Geography Department. Item analysis was computerized and performed by the Office of University Testing. After the pilot study, the test items were refined before being used again in the final study.

The computed reliability of the final test is shown in Table II. A specimen of the testing instrument is contained in the Appendix.

TABLE II

Reliability of the Final Test
Summary Statistics

	KR-20	KR-21	SPLIT-HALF	SPLIT-HALF*
RELIABILITY	0.66	0.63	0.47	0.64
STANDARD ERROR	2.51	2.62	3.13	2.58

*Estimated For Total Using Spearman-Brown Prophecy Formula.

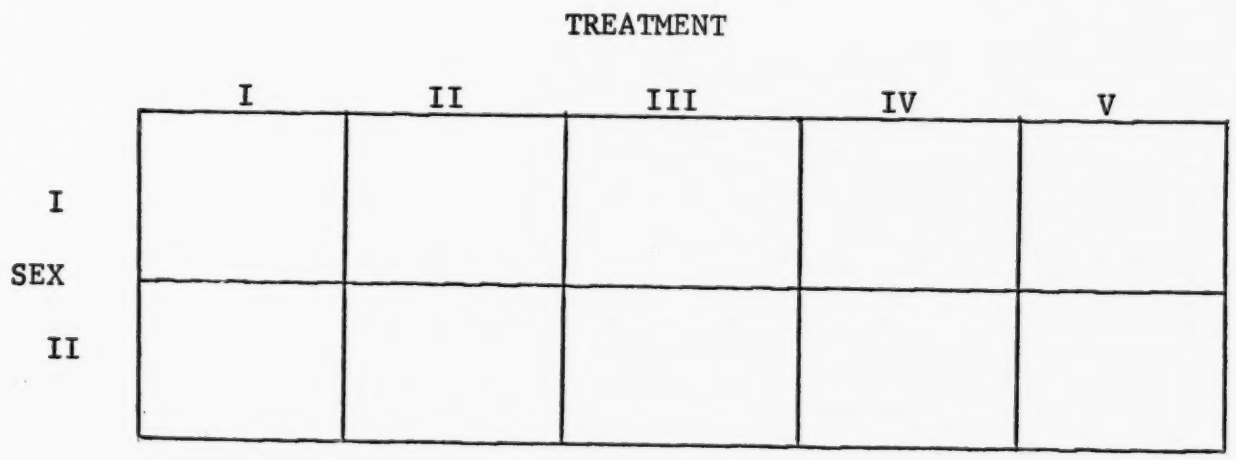
Number of items = 30.

ANALYSIS OF DATA

This section is divided into three parts. A statistical technique is first described; then it is followed by the tabulation of the original data and the analysis of test results.

The Statistical Technique

A two-way analysis of variance (ANOVA) was used to test for significant differences among group means. The two levels of one factor were male and female and of the other factor were the five methods of visual presentation. The distribution of the variables studied is shown in the following figure.



The IBM 360/40 of the Indiana State University Computer Center was used in all the analyses. Six ANOVA runs were made. For each of the two schools concerned, one run was made for Part I of the test, one for Part II, and one for the two parts combined.

The three research hypotheses were expressed in the "null" form for testing and they would be accepted or rejected at a significance

level of 0.05.

1. The hypothesis that the column means are equal. This hypothesis denoted by the symbol Hc, is written as:

$$Hc: \mu_{\cdot 1} = \mu_{\cdot 2} = \mu_{\cdot 3} = \mu_{\cdot 5} = \mu$$

In terms of these data, the hypothesis implies that in the population the five treatments are equally effective.

2. The hypothesis that the row means are equal. This hypothesis, denoted by the symbol Hr, is written as:

$$Hr: \mu_{1\cdot} = \mu_{2\cdot} = \mu$$

In terms of these data, this hypothesis implies that the male students perform as well as the female students in all the visual presentations.

3. The hypothesis that the interaction is equal. This hypothesis, denoted by the symbol Hrc, is written as:

$$Hrc: \mu rc - \mu r\cdot - \mu\cdot c + \mu = 0$$

In terms of these data, the hypothesis implies that there is no interaction between the sex and the treatment variables. This means that no one treatment is uniformly superior or inferior regardless of the sex of the pupils. If however, some treatments obtain better results with one sex than the other, and the opposite holds for the other treatments, then treatments and sex may be said to interact.

Tabulation of the Original Data

The mean scores for each treatment for each part of the test are presented in Table III. Each correct response of the fifteen items in each part was scored one.

TABLE III

IMMEDIATE TEST RESULTS: UNADJUSTED MEAN SCORES

GARFIELD: N = 143 STAUNTON: N = 61

NAME OF TEST*	Treatment / Sex	I	II	III	IV	V
GARFIELD PART I	I MALE	$\bar{x}$: 5.28 n: 14	6.00 15	6.40 15	5.75 12	6.46 13
	II FEMALE	$\bar{x}$: 5.21 n: 14	5.69 13	4.82 17	5.37 16	6.14 14
PART II	I	$\bar{x}$: 7.64 n: 14	8.07 15	7.40 15	8.00 12	7.31 13
	II	$\bar{x}$: 8.07 n: 14	7.46 13	6.82 17	7.25 16	6.28 14
I AND II COMBINED	I	$\bar{x}$: 12.93 n: 14	14.07 15	13.80 15	13.75 12	13.77 13
	II	$\bar{x}$: 13.29 n: 14	13.15 13	11.65 17	12.62 16	12.43 14
STAUNTON PART I	I	$\bar{x}$: 5.86 n: 7	3.00 3	4.20 5	7.13 8	3.67 3
	II	$\bar{x}$: 4.83 n: 6	6.29 7	7.13 8	6.67 6	5.00 8
PART II	I	$\bar{x}$: 8.86 n: 7	8.00 3	7.20 5	7.88 8	6.67 3
	II	$\bar{x}$: 8.17 n: 6	6.14 7	7.12 8	7.50 6	5.75 8
I AND II COMBINED	I	$\bar{x}$: 14.71 n: 7	11.00 3	11.40 5	15.00 8	10.33 3
	II	$\bar{x}$: 13.00 n: 6	12.43 7	14.25 8	14.17 6	10.75 8

* A TWO-WAY ANOVA WAS RUN FOR EACH TEST

Analysis of Test Results

Tables IV and V show the results of the six runs of the two-way ANOVA. The data revealed that in no case did the groups differ significantly. In other words, no significant differences at the 0.05 level were found in (1) the relative effectiveness among the five modes of visual presentation, (2) the mean scores between the males and females and (3) the interaction effects between the sex and the modes of presentation.

TABLE IV

IMMEDIATE TEST SCORES (GARFIELD): TWO-WAY ANALYSIS OF VARIANCE

UNEQUAL CELL FREQUENCY, UNWEIGHTED MEANS METHOD

PART I

SOURCE OF VARIATION	SS	DF	MS	F
Treatment	1.225	4	0.306	0.598
Sex	0.702	1	0.702	1.370
Interaction	0.712	4	0.178	0.347
Within Cell	965.004	133	0.512	

PART II

SOURCE OF VARIATION	SS	DF	MS	F
Treatment	1.670	4	0.417	1.041
Sex	0.638	1	0.638	1.592
Interaction	0.606	4	0.152	0.378
Within Cell	755.012	133	0.401	

I AND II COMBINED

SOURCE OF VARIATION	SS	DF	MS	F
Treatment	0.800	4	0.200	0.159
Sex	2.677	1	2.677	2.127
Interaction	1.653	4	0.413	0.328
Within Cell	2370.441	133	1.259	

TABLE V

IMMEDIATE TEST SCORES (STAUNTON): TWO-WAY ANALYSIS OF VARIANCE

UNEQUAL CELL FREQUENCY, UNWEIGHTED MEANS METHOD

PART I

SOURCE OF VARIATION	SS	DF	MS	F
Treatment	8.035	4	2.009	1.435
Sex	3.675	1	3.675	2.625
Interaction	7.519	4	1.880	1.343
Within Cell	383.670	51	1.400	

PART II

SOURCE OF VARIATION	SS	DF	MS	F
Treatment	5.756	4	1.439	1.666
Sex	1.532	1	1.532	1.774
Interaction	0.924	4	0.231	0.267
Within Cell	236.765	51	0.864	

I AND II COMBINED

SOURCE OF VARIATION	SS	DF	MS	F
Treatment	21.063	4	5.266	1.650
Sex	0.460	1	0.460	0.144
Interaction	6.526	4	1.631	0.511
Within Cell	874.848	51	3.192	

DISCUSSION

Limitations

In this experiment, the following limitations are identified:

1. The sample. The five groups of students in Garfield High School were not "randomized" in the sense that the table of random number was used. However, they were not grouped according to ability, but rather grouped by the computer according to the convenience of each individual's class schedule at the beginning of the school year.

2. The sample size. The five groups of students in Staunton High School were randomized by the use of random numbers, but unfortunately, the total number was only 61 because some students did not turn up on the day of the experiment.

3. The test. The total test consisted of 30 items which were divided equally into two parts. The test reliability, according to KR-20, is 0.66. The investigators feel that more items should be added to the test to improve reliability further.

4. Another source of weakness was the length of the instruction. The total time of the 36 slides was 20 minutes. After such a short period of instruction, it may be difficult to identify significant effectiveness in any one of the five modes of presentation.

5. Due to the lack of time, no delayed test was administered. The null hypotheses were accepted on the basis of the immediate post-test scores though the stability of the test was not determined.

Recommendations

A conclusion from this study was that the males and females learn equally well in terms of achievement scores in multiple-image presentations. This was different from the studies of Lombard (1970). Lombard conducted the experiment with the eleventh graders and found that girls learned significantly better from the three-screen presentation than from the single-screen presentation. For the subject material used in this study, the investigators found that there was no significant difference in the scores between the males and females in any of the five types of visual presentations.

In this study, the test was divided into two parts: Part I was to determine the comprehension of the image relationships; Part II the comprehension of the individual pictures and the taped narration. It was found that Part I of the test tended to favor the multiple-screen presentation more than the single-screen presentation. Perhaps, if the length of Part I and the instructional period were increased and more appropriate subject materials were selected, the advantages of multiple-screen presentations might become significant.

Another hypothesis that this present study tends to suggest is that for the subject materials used in this experiment, the multiple-screen presentation using the programmed image-accumulation technique seems to be more effective than the ones using the regular image-accumulation technique. In fact, in each school the highest mean scores on Part I were from one of the presentations using the programmed

image-accumulation technique.

Data from this study show inconclusive results as to the effectiveness of the different types of multiple screen presentations. These investigators think that further research is needed in this area because of its implications in the design of visual materials such as filmstrips, slides, and textbook illustrations.

SUMMARY

Purpose

This experiment was designed to study the effectiveness of various techniques of organizing and cumulating images on multiple screen slide-tape presentations to convey geographical information.

Procedure

The investigators developed stimulus materials which were presented in five different ways. In treatment I, the slides were projected sequentially on one screen. In treatments II and III, slides were projected cumulatively and regularly on two and three screens respectively. In treatments IV and V, the images were programmed on two and three screens respectively. In all treatments, the length, the taped narration, and the sequence of the slides were identical.

A two-part test was developed: Part I, to determine the comprehension of the image relationships; Part II, the comprehension of the individual pictures and the narration.

After a pilot study, the experiment was conducted with 143 tenth-graders randomized into five groups. It was replicated in another school the following day. A two-way ANOVA was used for each part of the test, the combined test, and repeated for each school.

Results

No significant differences at the 0.05 level were found in (1) the relative effectiveness among the five modes of presentation,

(2) the mean scores between the males and females and (3) the interaction effects between the sex and the modes of presentation.

Implications

In most cases, the groups that viewed the multi-image presentations had higher scores on Part I of the test than those that viewed the single-screen presentation. In each school the highest mean scores for Part I were from one of the presentations using the programmed image accumulation technique. Perhaps the advantages of this mode of presentation would be significant over a longer instructional period, with different age groups, or subject materials.

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APPENDIX

PLEASE DO NOT WRITE ANYTHING ON THE TEST PAPERS. THEY HAVE TO BE HANDED IN AT THE END OF THE TEST. THIS TEST IS DIVIDED INTO TWO PARTS.

TEST INSTRUCTIONS FOR PART I

Below are figures 1-14 each of which has four locations identified as a, b, c, and d. For each figure a slide will be shown for just half a minute.

Each slide will represent ONE of the locations a, b, c, or d. You are to select the proper location a, b, c, or d, and MARK WITH A PENCIL THE CORRECT RESPONSE ON THE ANSWER SHEET.

Please be certain that only ONE response is marked. If you cannot decide on an answer for any question, make the best guess you can.

Question 15 is self-explanatory.

Lest us now start.

PART I

1. This is the picture for figure 1. Which letter in figure 1 corresponds to the location of the picture in the screen?

Fig. 1

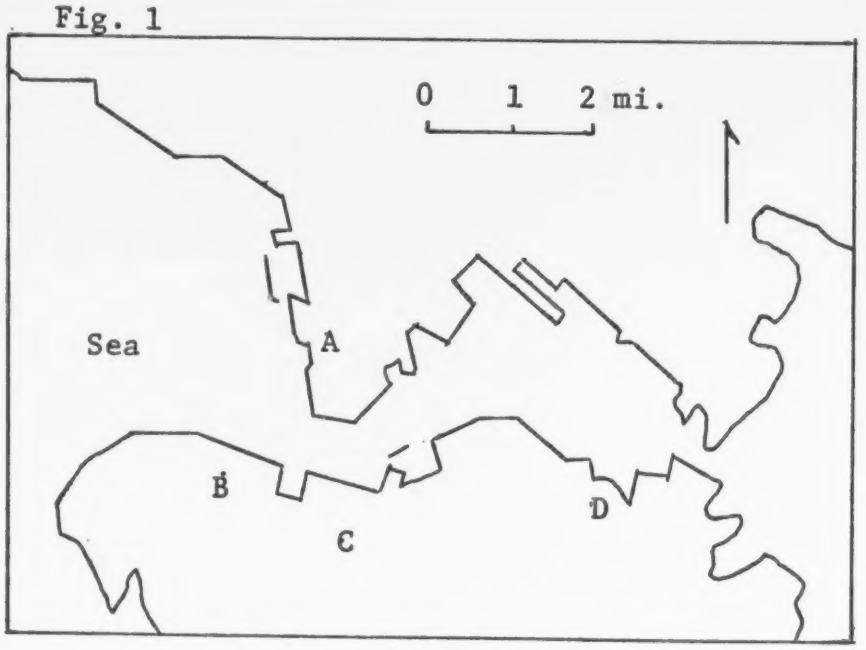
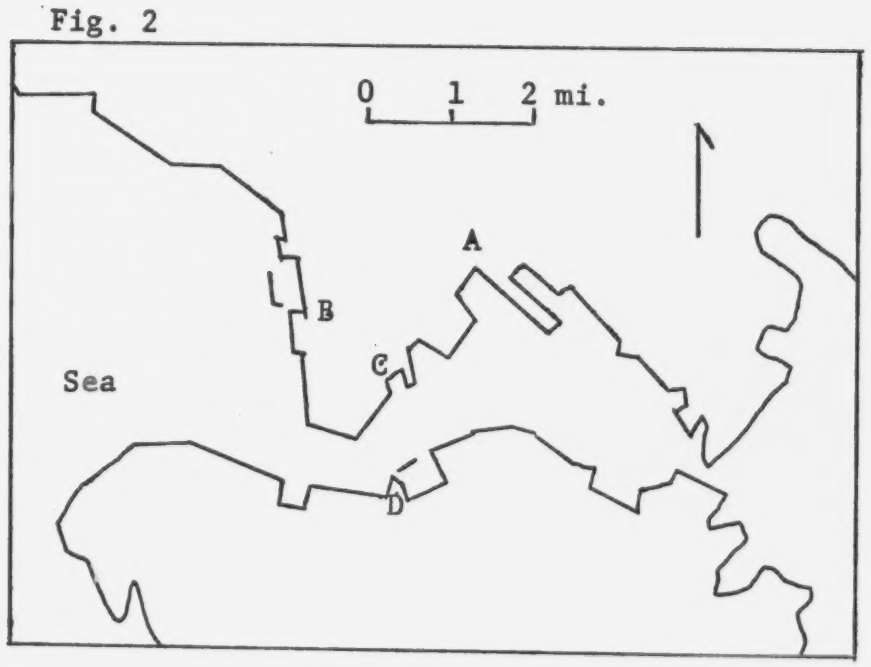
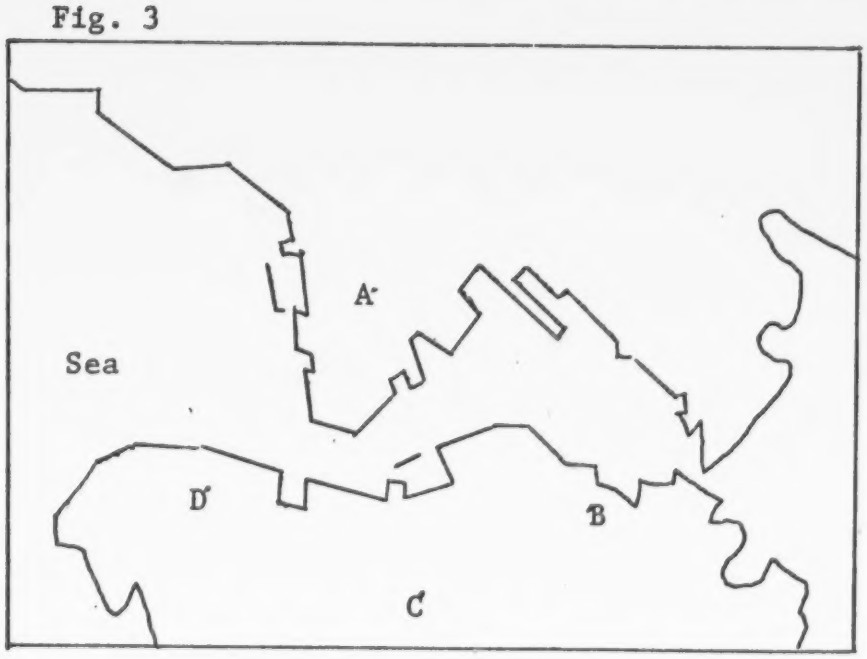


Fig. 2



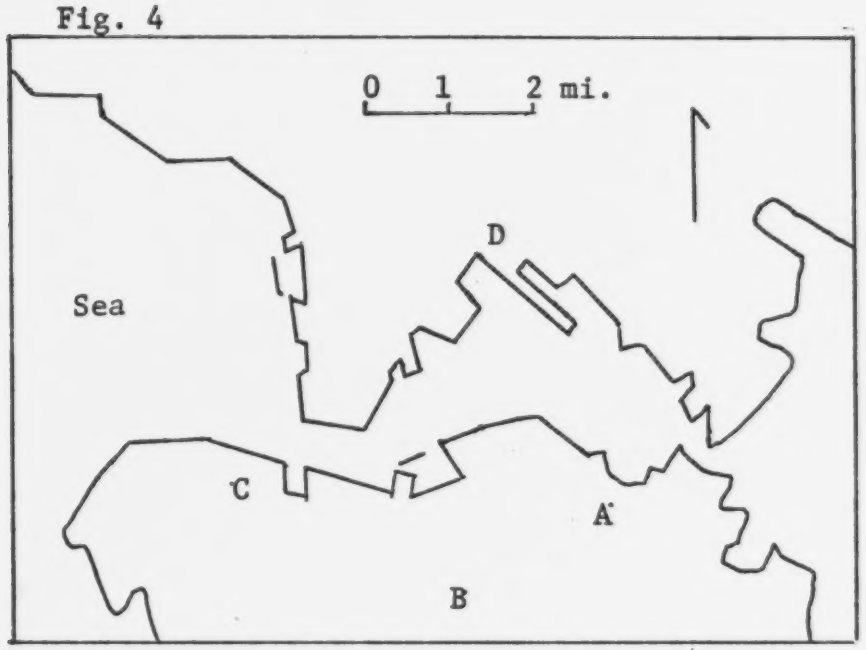
2. This is the picture for figure 2. Which letter in figure 2 corresponds to the location of the picture in the screen?

Fig. 3



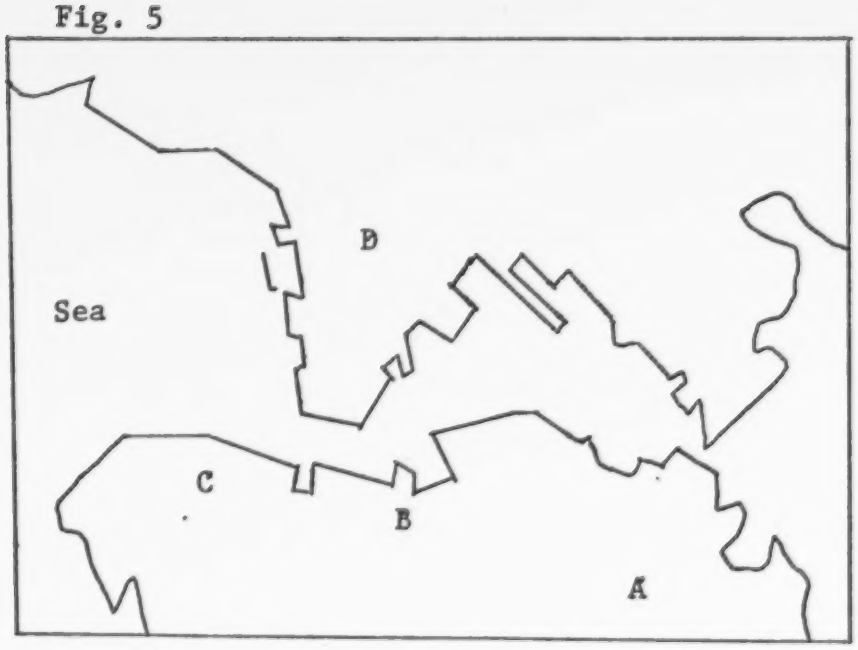
3. This is the picture for figure 3. Which letter in figure 3 corresponds to the location of the picture in the screen?

Fig. 4



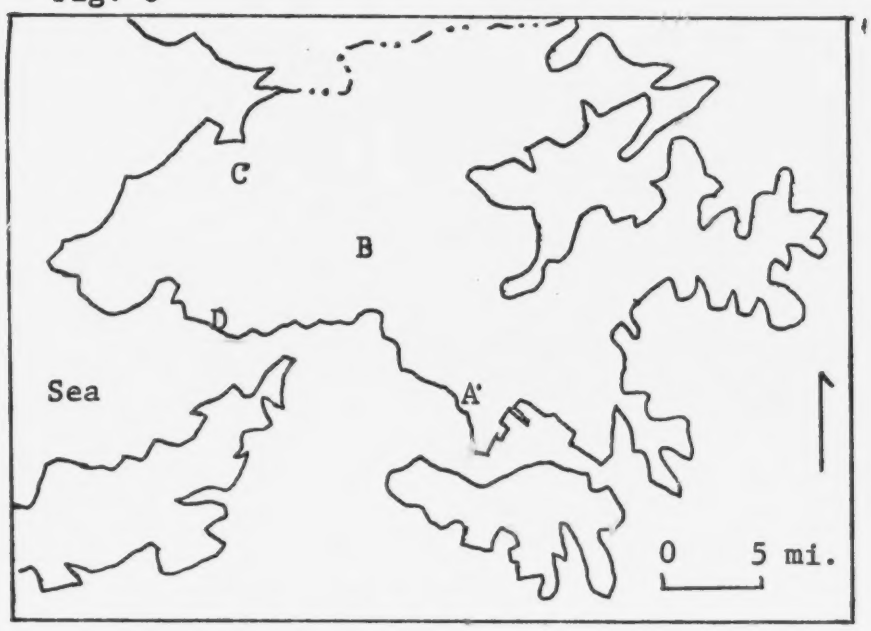
4. This is the picture for figure 4. Which letter in figure 4 corresponds to the location of the picture in the screen?

Fig. 5



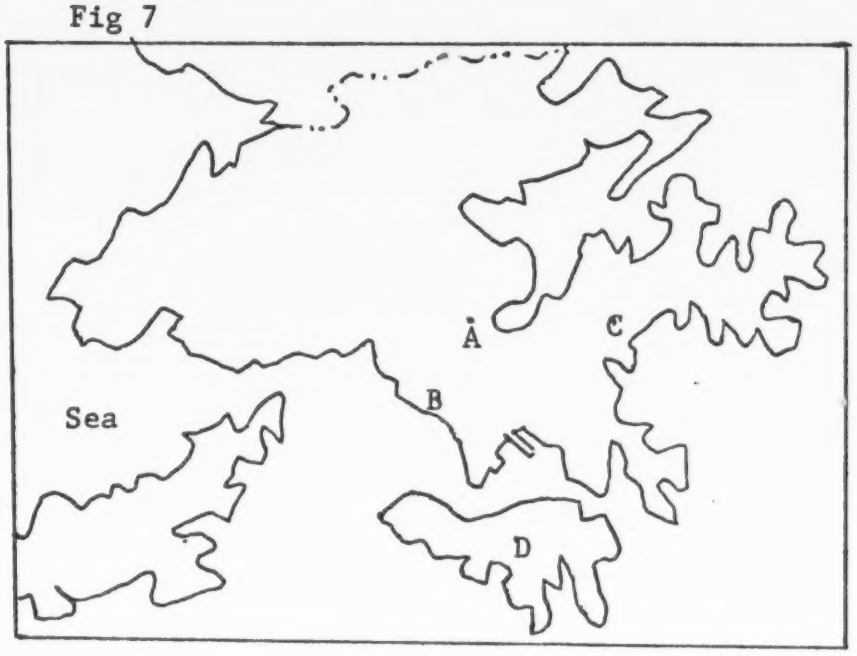
5. This is the picture for figure 5. Which letter in figure 5 corresponds to the location of the picture in the screen?

Fig. 6



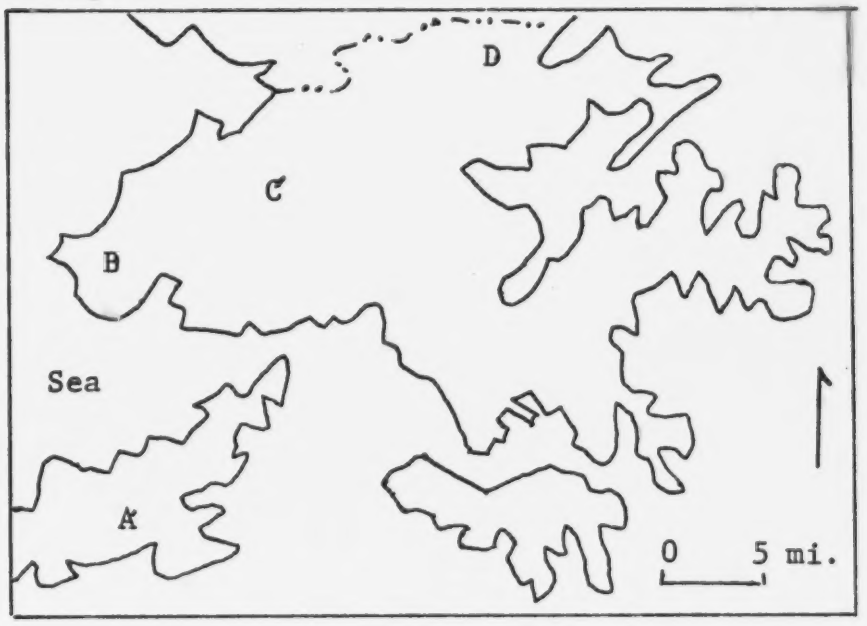
6. This is the picture for figure 6. Which letter in figure 6 corresponds to the location of the picture in the screen?

Fig 7



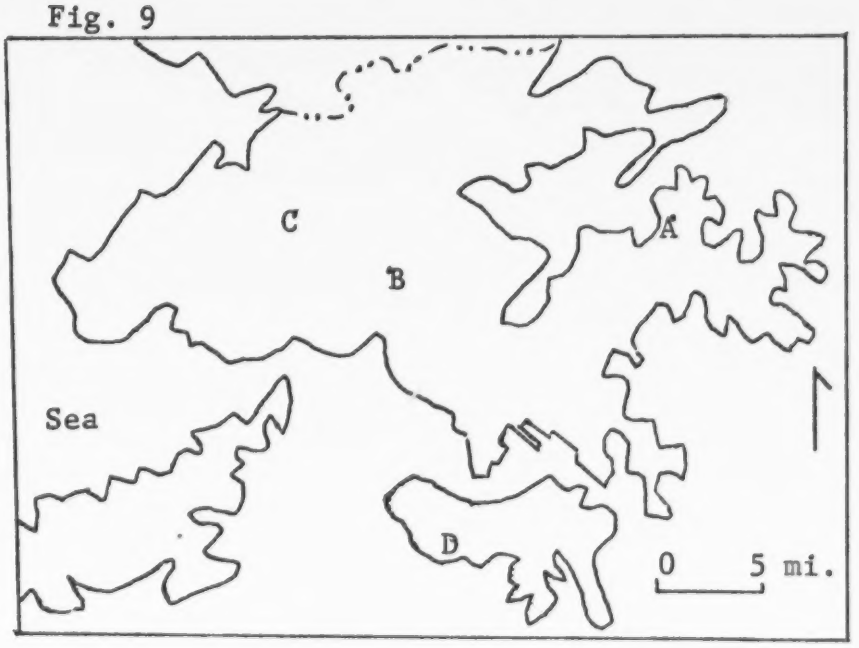
7. This is the picture for figure 7. Which letter in figure 7 corresponds to the location of the picture in the screen?

Fig. 8



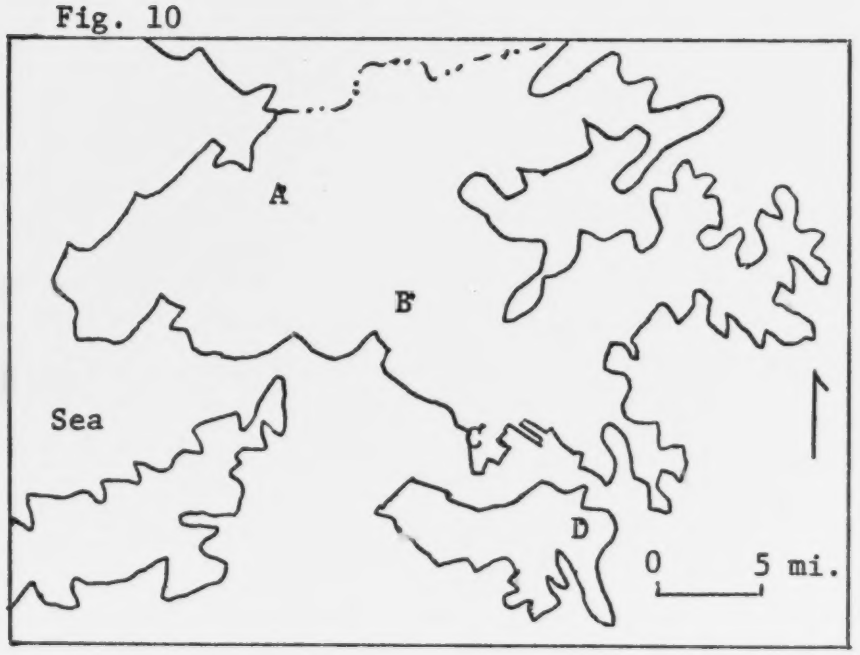
8. This is the picture for figure 8. Which letter in figure 8 corresponds to the location of the picture in the screen?

Fig. 9



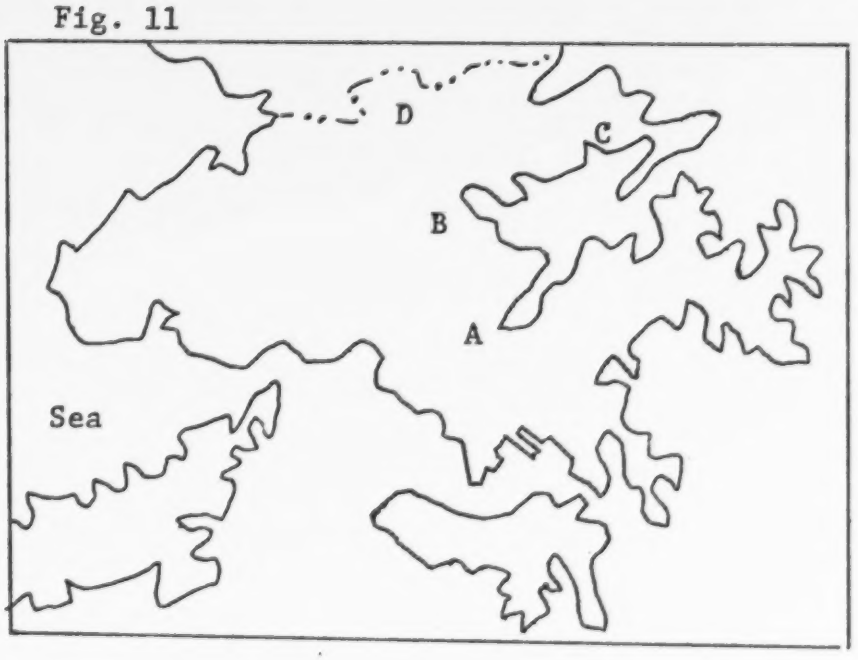
9. This is the picture for figure 9. Which letter in figure 9 corresponds to the location of the picture in the screen?

Fig. 10



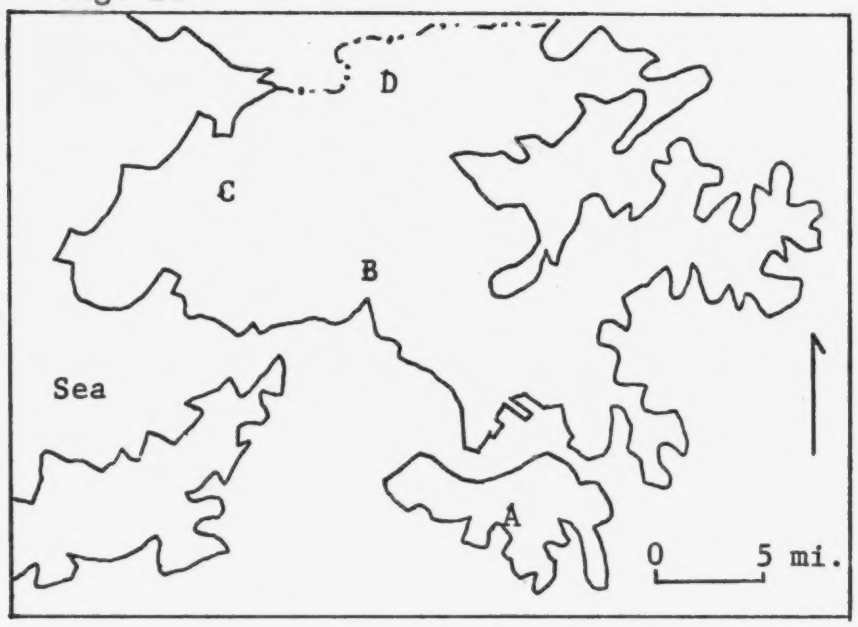
10. This is the picture for figure 10. Which letter in figure 10 corresponds to the location of the picture in the screen?

Fig. 11



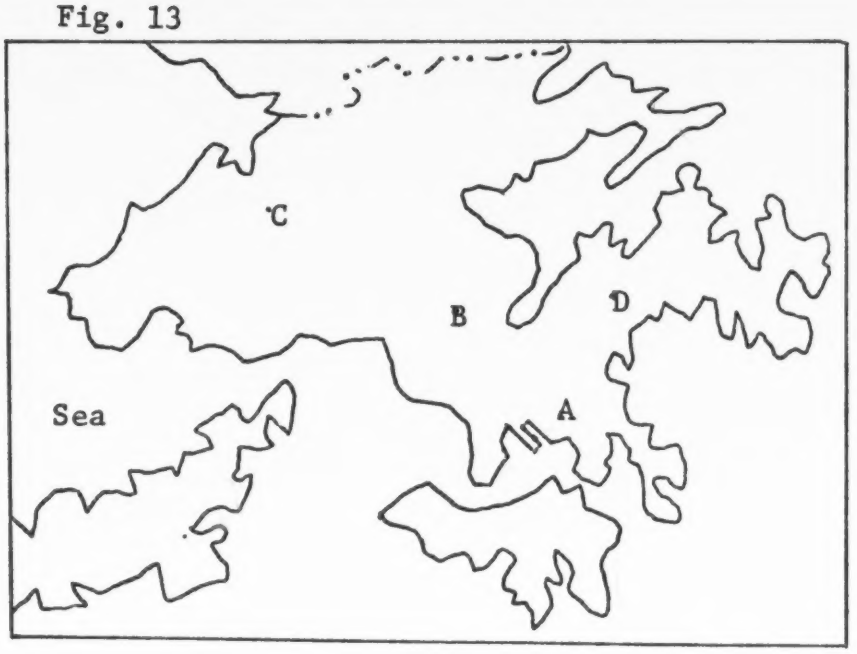
11. This is the picture for figure 11. Which letter in figure 11 corresponds to the location of the picture in the screen?

Fig. 12



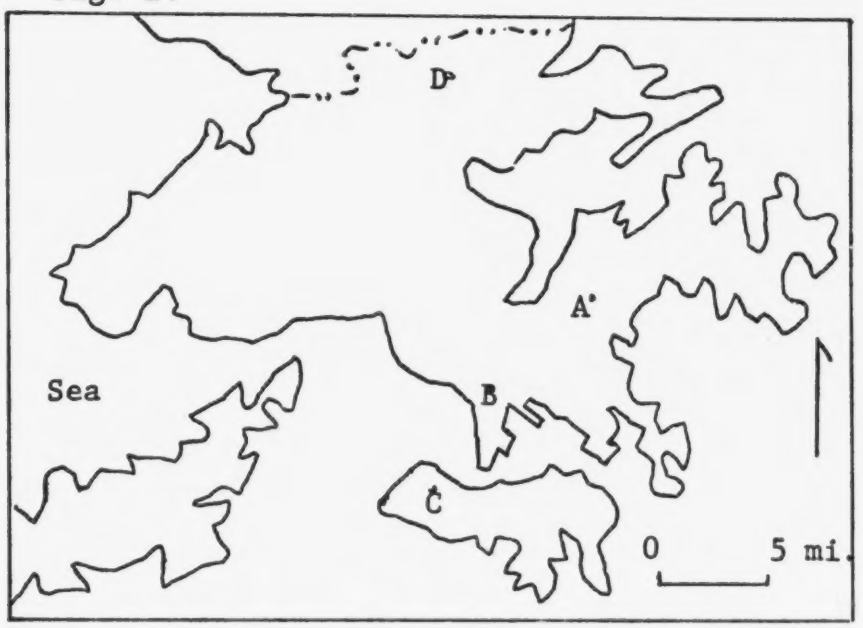
12. This is the picture for figure 12. Which letter in figure 12 corresponds to the location of the picture in the screen?

Fig. 13



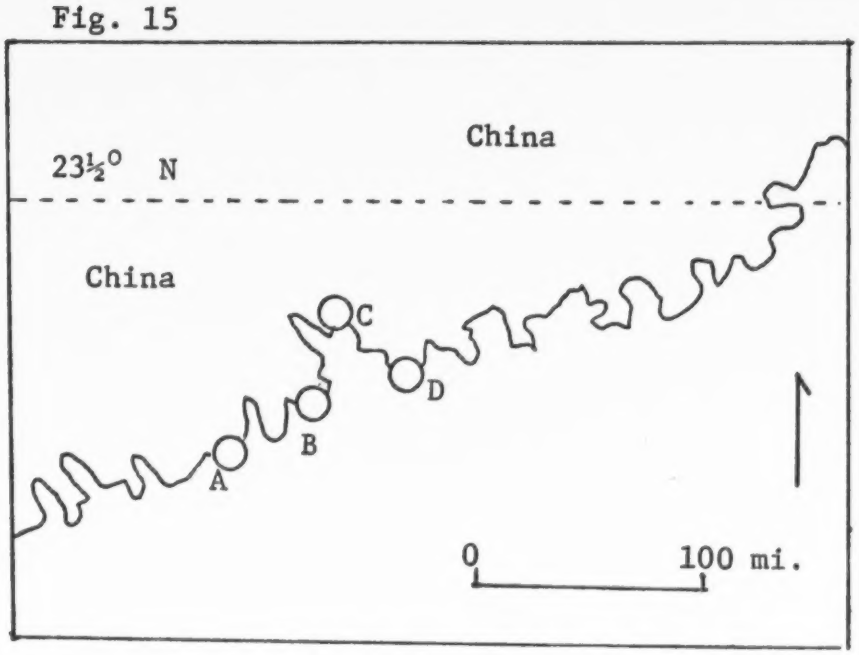
13. This is the picture for figure 13. Which letter in figure 13 corresponds to the location of the picture in the screen?

Fig. 14



14. This is the picture for figure 14. Which letter in figure 14 corresponds to the location of the picture in the screen?

Fig. 15



15. Which letter in the map, which is shown on your test paper, (figure 15) represents the position of Hong Kong?

PART II

Questions 16-30 have four responses each. After reading the question carefully, select the correct response and mark the proper letter on your answer sheet. Only one response is correct for each question. If you cannot decide on an answer for any question, make the best guess you can. Now let us start.

16. Which one of the following places did Britain obtain from China in 1899?
    a. The New Territories.
    b. Kowloon Peninsula.
    c. Hong Kong Island.
    d. None of the above.

17. Which one of the following figures concerning Hong Kong is false?
    a. 13% of the total area is cultivated.
    b. In 1969, vegetables accounted for 78% of farm production.
    c. 80% of the total land area is mountainous.
    d. 80% of the local people are Chinese.

18. Which of the following contributes most to the economy of Hong Kong?
    a. Farming
    b. Fishing
    c. Grazing
    d. Tourism

19. Which of the following concerning the city of Hong Kong is true?
    a. Roads are wide and straight.
    b. Because of the lack of space, many people are now living on the hills.
    c. Most of the lowland along the coast was reclaimed from the sea.
    d. Many beggars are seen along the side-walks.

20. Which of the following statements concerning the Victoria Harbour is false?
    a. water inside the harbour is often very rough.
    b. the harbour is ice-free.
    c. water inside the harbour is deep.
    d. the harbour is wide inside.

21. Where do you expect to find an extended amount of open space not used by the inhabitants of Hong Kong?
    a. In the farms.
    b. On the mountains.
    c. On the plains.
    d. Along the rivers.

22. What is the common direction (or trend) of the mountain ranges in Hong Kong?
    a. N to S.
    b. E to W.
    c. NE to SW.
    d. NW to SE.

23. Which of the following is <u>not</u> typical of the eastern part of the New Territories?
    a. There are many off-shore islands.
    b. Mountains have roughly the same height.
    c. Population is sparse.
    d. Because of the rough seas, fishing ports do not exist.

24. Which of the following explains for the lack of grazing activities in the mountainous areas?
    a. There is a lack of labor supply.
    b. The mountains are often very steep.
    c. There is a lack of market for the animal products.
    d. There is a lack of capital for development.

25. Which of the following statements concerning agriculture in Hong Kong is <u>false</u>?
    a. Poultry and pigs are the important animals raised.
    b. Rice fields are usually not found near the fish ponds.
    c. Cars are usually inaccessible to the farms.
    d. Fields are intensively cultivated.

26. Which of the following is seen in the North-Western part of the New Territories?
    a. Fish ponds.
    b. Fields for grazing.
    c. Off-shore islands.
    d. Fishing ports.

27. Which of the following is <u>not</u> a characteristic of the farm houses in the New Territories?
    a. Trees are found near the farm houses.
    b. Unsanitary conditions.
    c Straw is usually the roofing material.
    d. They usually have brick walls.

28. Which of the following is <u>not</u> a good explanation for the lack of mechanization in the farms in the New Territories?
    a. Farm machines are unavailable.
    b. Farmers are poor.
    c. Fields are small and fragmented.
    d. Many farmers lack mechanical knowledge.

29. Which of the following gives the best explanation for the existence and development of fish ponds in the New Territories?
    a. The land is flat.
    b. Not much labor is needed.
    c. Rainfall is adequate.
    d. There is a great demand of fish.

30. Which of the following has contributed to the increasing importance of vegetable growing in Hong Kong?
    a. People change to eat more bread and vegetables.
    b. The soil is suitable for growing vegetables.
    c. The government encouraged the growing of vegetables.
    d. More income can be earned by growing vegetables.